A Study for immerge VR Applied in RC Building Earthquake Damage Assessment

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Abstract - The damage to the building structure after damage caused by external forces will be used for subsequent treatment such as repair, reinforcement or demolition. However, the current evaluation methods mostly require professionals' experience and academic background, which cannot be widely popularized. Therefore, general personnel such as users or insurance claims personnel must conduct preliminary investigations. However, if the form of structural damage is displayed in unit parts, there will be a huge gap with real structure damage conditions after hazard. If we can build a three-dimensional model of analysis and theoretical structure damage and user can enter the virtual space for observation training, it will effectively improve the accuracy of future practical application.

For actual structural damage behavior, researchers used experiments in the laboratory tests, the structure analysis by software such as SAP program provide function of pushover to analysis the structure behavior subjected to lateral force, which we can evaluate the behavior of the structure from the original state to the destruction. This paper we used the SAP pushover function to analyze the failure mode of the structure at different stages. The failure mode of the system is evaluated by the stress analysis then we setup SketchUp model to simulate the damage behavior in different stages. Then import the 3D model to cloud VR system users can view the models in 3D immerge environment. To establish immerge VR structural damage assessment training system. Users can actually observe structural damage in a VR not only to protect users from the risk of entering the actual building to define the damage it can also improve the accuracy of future practice judgments.

Keywords: Immerge VR, structure damage simulation, SAP pushover, SketchUp